

APPLICATION

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TITLE SYSTEM AND METHOD FOR
MEASURING AND MANAGING
PERFORMANCE IN AN
INFORMATION TECHNOLOGY
ORGANIZATION

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5 Technical Field of the Invention

10 Developing a system that measures the performance of an
IT organization is critical to managing the IT organization
and continually improving the processes that it employs over
time. However, no regular, canonical method for developing
a system that measures the performance of an IT organization
15 is evident in the industry. The lack of such a method
creates great difficulty in understanding the performance of
the IT organization, and this is a critical aspect to
successful management and improvement of the IT organization
over time. This problem has existed since the formation of
20 IT organizations. Consequently, there is a need in the art

for a repeatable work product-based method for defining and implementing a measurement program for an IT organization.

There is a need in the art for a system and method for providing measurement gap analysis describing the relationship between the measurement system and the underlying organization and processes. Without appropriate organizational and process support, it is difficult for any measurement system to achieve maximum potential usefulness. Measurement systems that are supported by the appropriate organizational structure and are fully integrated with the organizations process have a much higher probability of being effective.

It is an object of the invention to provide a system and method for systematically defining and implementing a measurement program.

It is a further object of the invention to provide a system and method for implementing a measurement program that is supported by an appropriate organizational structure and that is fully integrated with the organization's processes.

It is a further object of the invention to provide a

system and method for developing measurement reporting methods.

It is a further object of the invention to provide a system and method for developing training and end-user support materials for a measurement system.

Summary of the Invention

A system and method for defining and implementing measurements to support a customer information technology organization. Steps involve identifying customer performance goals; building a model in response to customer goals including a plurality of primitive metrics; performing a gap analysis of the model to determine which of the primitive metrics are already collected by the organization and the process capabilities to support the data collection; identifying new data collection sources for the primitive metrics which are not already collected by the organization; and implementing the tools and processes for gathering all of the primitive metrics and tools for generating measurement reports from the gathered primitive metrics.

and performance management (MAPM) method of a preferred embodiment of the invention.

Figure 3 is a diagram detailing the high-level overview of the MAPM method of Figure 2 from a work product-based view.

Figure 4 is a diagram illustrating the measurement gap analysis embodiment of the invention.

Figure 5 is a diagram illustrating a measurement model for an IT organization including the notion of behaviors in accordance with a preferred embodiment of the invention.

Best Mode for Carrying Out the Invention

Referring to Figure 1, the process of the preferred embodiment of the invention for creating a measurement model work product 102 is part of the requirements phase of the measurement and performance management (MAPM) methodology. This process relies on input from a target future business

throughout steps 200-206.

Referring to Figure 3, the system and method of the preferred embodiments of the invention are built upon the IBM Work Product-based Methodology Development Approach as defined and implemented by Solution Consulting Integration (SCI) practice through its SCI Enablement Process and new work products which extend the SCI method. These new work products include three work products representing the formulation of the measurement requirements that are to be implemented in an engagement, and are illustrated in Figure 3 as measurement model 102, current customer measurements 242, and measurement gap analysis 103. These new work products also include four work products representing additional implementation and/or technical requirements to support the implementation of measurement model 102, and include interface agreement 268, configuration script 272, contract measurement business policy 276, and scorecard 270.

Practitioner accesses to the documents that are the work products of the preferred embodiment of the method of the invention may be, for example, by way of HTML code that provides users of the method access to work product (WP) dependency diagrams, engagement models, work product description papers and work product technique papers.

In step 316, other requirements for measurement program success are identified.

The canonical method of the preferred embodiment of the invention for developing a system that measures the performance of an IT organization involves identifying measures for an IT organization that are directly tied to goals and behaviors that the IT organization should be exuding, as defined by the IT management team. "Canonical" means fully thought through and consistent. The measurement model work product 102 and associated techniques work from a top-down approach, starting with the goals of the organization, identifying appropriate behaviors and finally associating measures that will empirically demonstrate achievement of the behaviors. In addition, algorithms for prioritization are executed to ensure that the best fitting measures are selected in the final measurement model.

Referring to Figure 5, this canonical process for defining measurements model work product 102 includes in step 232 articulating the envisioned to-be business goals through a series of goals and questions or behaviors. In step 236, in an optional, more specific embodiment, standard business policy driving behaviors that are assumed or expected are defined. In step 234, a measurements catalog

of industry measurements are enumerated and fully defined in a database of existing contract measurements, including behaviors and goals that they satisfy.

In step 326, an intellectual mapping is done between the envisioned to-be business goals and potential measures. A prioritization and balancing process is applied to ensure that the best measures are selected. This step 326 involves a two step prioritization and balancing process including, in step 328, prioritization of measures by number of objectives and behaviors satisfied, and in step 330 identification of measures that have the highest number of occurring related measures in the same or another category.

The method of the preferred embodiment of the invention draws upon several concepts from goals-question-metric (GQM) techniques described in Basili, Victor et al., "The Goal Question Metric Approach," Institute for Advanced Computer Studies, Department of Computer Science, University of Maryland, College Park, Maryland. To this are added notions of behaviors as a bridge between organizational goals and the identification and definition of measures that enable the required behaviors attempting to occur. The inclusion of behaviors in the overall technique implemented by the preferred embodiment of the invention creates a more tightly

integrated measurement model especially when dealing with measurement definition at the IT organization level, where business drivers and other organizational objectives form the basis of measurement requirements. Behaviors are the performance expectations of the individuals affected by the measurement model. These could be new ways of acting or new areas of focus in the respective roles on the account.

~~Referring to Figure 6, a more detailed description of this canonical process includes, in step 340, defining the IT organization goals; in step 341, defining associated behaviors; in step 342, mapping behaviors against the measurement catalog; in step 343, building a first draft measurement model; in step 344 prioritizing measures by number of behaviors satisfied; in step 345, prioritizing measures on number of related measures; in step 346 building a second draft measurement model; and in step 347 performing gap analysis. Each of these steps will be further described.~~

In step 340, IT organization goals are identified during the creation of target future business capabilities work product 101. Typically, the goals of the organization are broken out into one or more categories of measures. In accordance with the preferred embodiment of the invention,

these six categories include those previously discussed in connection with Figure 2, and are human resources 210, quality 211, customer 212, cost and schedule 213, process 214, and productivity and output 215.

5 In step 341, behaviors that best demonstrate achievement of a particular organizational goal are defined. For each of the organization goals defined in target future business capabilities work product 101, one or more behaviors are defined. Similar in concept to the question
10 aspects of the GQM approach, behaviors are defined to represent those characteristics the IT organization should foster as part of its normal operations. Behaviors identify an end state that should be directly tied to the organizations goals.

15 As an example, if the organization's goal is in the area of ensuring that appropriate processes exist in the IT department, several behaviors might be identified, such as (1) the ability of the organization to forecast process needs, that is processes that should exist today but do
20 not); (2) the knowledge of the IT staff of existing processes; (3) the ability to manage to process gaps; and (4) the consistent use and adherence to documented processes.

Behaviors are typically simple sentence structures and may even be incomplete sentences. They are short statements that represent ideas, actions or activities that demonstrate commitment and refinement of the organization goals.

5 Typically, the organization goals are expressed as high level statements or highly summarized notions. Behaviors are intended to be a level or two below the organization goals and bring about a level of granularity low enough to support identification of measures that might empirically demonstrate achievement of the desired behaviors.

A sample table for capturing the results of this step 341 is included in Table 1: Goals, Behaviors, and Measurements:

TABLE 1: GOALS, BEHAVIORS, AND MEASUREMENTS

Goal 1	Behavior 1	Measurement 1
Goal 2	Behavior 2	Measurement 2

where measurements are those identified in step 342, infra.

In step 342, those measurements from the measurement catalog 234 that best satisfy the identified behaviors are identified. This catalog is a database accessed using associated behaviors as a search parameter.

In step 343, the first draft 326 of measurement model 102 is built. This involves documenting the results of step 342 in the measurements column of Table 1 and in measurements model 326. In addition, other attributes of the measures are captured in measurement model 326, with their base values coming from measurement catalog 234. Table 2 illustrates the fields in measurements model 326 for capturing measurements and other attributes.

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TABLE 2: MEASUREMENTS MODEL FORMAT

FIELD NAME	DESCRIPTION
MEASUREMENT NAME	NAME OF THE MEASURE
5 MEASUREMENT DEFINITION	ITS DEFINITION
ELEMENTAL METRICS	WHAT IS THE ELEMENTAL DATA REQUIRED TO CALCULATE THE MEASURE?
10 MEASUREMENT CALCULATION	HOW IS THE MEASURE CALCULATED?
RELATED MEASUREMENTS	WHAT RELATED MEASURES EXIST FOR THIS MEASUREMENT?
FREQUENCY OF DATA CAPTURE	HOW OFTEN IS DATA FOR THIS MEASURE COLLECTED?
15 FREQUENCY OF MEASUREMENT REPORTING	HOW OFTEN ARE THE RESULTS OF THIS MEASURE REPORTED?
REPORTING PROCESS	WHAT I.T. PROCESS TYPICALLY REPORTS THIS DATA?
20 EVENT TRIGGER	WHAT EVENT OR STEP IN THE PROCESS TRIGGERS THE AVAILABILITY OF THIS DATA
ORGANIZATIONAL OWNER	NAME OF ORGANIZATIONAL OWNER

25 In step 344, a first prioritization exercise 328 is performed on the measures in the first draft 326 of measurement model 102. For each of the measures identified in step 342, a table is built that describes the relationship with each of the behaviors it may satisfy. In

BEHAVIORS/MEASUREMENTS

5	PEOPLE BEHAVIORS	CONTRACTOR ENGAGEMENT DURATION	CONTRACTOR USAGE	UNFILLED POSITIONS	JOB OFFER ACCEPTANCE RATE
10	FORECAST SKILLS NEED ON A ROLLING X MONTH BASIS				
	KNOW/MONITOR THE CURRENT SKILLS	X	X	X	
	MANAGE TO THE SKILLS GAP		X	X	
15	ACTIVELY MANAGE ENVIRONMENTAL ISSUES				
	PLAN AND MANAGE TO SHORT-TERM AND LONG-TERM USAGE OF CONTRACTORS	X	X		
20	MANAGE TO THE REDUCTION OF LONG-TERM CONTRACTOR DEPENDENCIES	X	X		
25	RECRUIT ENTRY LEVEL STAFF TO MEET A PORTION OF FUTURE SKILLS NEED			X	
	HIRE EXPERIENCED PEOPLE TO FILL IMMEDIATE SKILL NEEDS, WHICH ARE LONG- TERM IN NATURE	X		X	
30	PROACTIVELY MANAGE RECRUITMENT UNTIL NEW HIRES ARE ON-BOARD				X
35	PROACTIVELY FOSTER LONG- TERM RELATIONSHIPS WITH LOCAL RECRUITMENT SOURCES				
	CREATE AN ENVIRONMENT ATTRACTIVE TO TARGETED RECRUITS				
40	MEASUREMENT SUBTOTAL	4	4	4	1

The measurement subtotal scores in Table 3 are derived from simple counts of the numbers of X's in each of the columns. Those measures with the highest scores satisfy the most number of behaviors and are more desirable as measurers
5 in the model since they provide more knowledge and insight for the cost of implementation. Of course, the table could be modified to reflect weighting factors on both cost and effectiveness, but such is not deemed essential for this embodiment of the invention.

10 In step 345, the second prioritization process 330 is performed on the measurements in the first draft 326 of measurement model 102. For each of the measures identified in step 342, a table is built that describes the related measure. In many cases a single measure may actually be
15 related to more than one measure. This is important in the identification and selection of measures, since it is most desirable to keep the final number of measures to a minimum. This prioritization process 330 is done for each of the categories of the measurement model. Table 4, Second
20 Prioritization Example: People Measurements, illustrates how to capture the prioritization in this step 345.

**TABLE 4: SECOND PRIORITIZATION EXAMPLE: PEOPLE MEASUREMENTS
PART A**

		PEOPLE MEASUREMENTS			
5	PEOPLE MEASUREMENTS	JOB SATIS- FACTION	TURNOVER RATE	REASONS FOR EXIT	CERTI- FICATION PROGRAM EFFECTIVE- NESS
10	JOB SATISFACTION	0	X	X	X
	TURNOVER RATE		0	X	X
	REASONS FOR EXIT	X		0	
15	CERTIFICATION PROGRAM EFFECTIVENESS	X	X		0
	CONTRACTOR ENGAGEMENT DURATION	X			
	CONTRACTOR USAGE	X			
20	UNFILLED POSITIONS	X			
	JOB OFFER ACCEPTANCE RATE				X
	MEASUREMENT SUBTOTAL	5	2	2	3

**TABLE 4: SECOND PRIORITIZATION EXAMPLE: PEOPLE MEASUREMENTS
PART B**

PEOPLE MEASUREMENTS					
	PEOPLE MEASUREMENTS	CONTRACTOR ENGAGEMENT DURATION	CONTRACTOR USAGE	UNFILLED POSITIONS	JOB OFFER ACCEPTANCE RATE
5	JOB SATISFACTION		X		
10	TURNOVER RATE	X	X		
	REASONS FOR EXIT				
	CERTIFICATION PROGRAM EFFECTIVENESS				
15	CONTRACTOR ENGAGEMENT DURATION	0		X	
	CONTRACTOR USAGE		0	X	X
	UNFILLED POSITIONS			0	X
20	JOB OFFER ACCEPTANCE RATE	X	X		0
	MEASUREMENT SUBTOTAL	2	3	2	2

The measurement subtotal is derived from the sum of X's in each of the columns. Those measures that have the highest scores also have the highest number of related measures, making them desirable as measurement for the base model. When prioritized against the results of the behaviors to measurement matrix (Table 3), an initial set of measurements can be identified. The cells with a "0" entry indicate the same measure to same measure condition, which

should not be considered in the matrix, because it is not meaningful to relate a measure to itself.

In step 346, the results of the prioritization processes 328 and 330 are used to build the second draft 332 of measurement model 102. The tables built in steps 344 and 345 are used to select those measures that should be included in the final measurement model. A simple approach is to calculate the mean values of measurement subtotals from each of Tables 3 and 4 and select those measures that have scores greater than or equal to that mean.

As an example, in step 344, the mean score is

$$[(2+2+2+0+4+4+4+1)/8] = 2.375$$

As a result, the following measures would be selected: contractor engagement duration, contractor usage, and unfilled positions. Some measures may need to be included in measurement model 102 in exception of this prioritization process either because of specific customer need or because it may be the only measure that satisfies a particular behavior and/or goal.

The selected measures are then captured in the format
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described in step 343, Table 2.

In step 347, once the final set of measures has been documented, a gap analysis 103, as previously described in connection with Figure 4, needs to be done to ensure that linkages are in place between the measurements, processes and organization. In addition, any time a change that results in the addition or deletion of a measurement in the model occurs, the gap analysis step is performed.

Advantages over the Prior Art

It is an advantage of the invention that there is provided a system and method for systematically defining and implementing a measurement program.

It is a further advantage of the invention that there is provided a system and method for implementing a measurement program that is supported by an appropriate organizational structure and that is fully integrated with the organization's processes.

It is a further advantage of the invention that there

Further, each step of the method may be executed on any general computer, such as an IBM System 390, AS/400, PC or the like and pursuant to one or more, or a part of one or more, program elements, modules or objects generated from any programming language, such as C++, Java, Pl/1, Fortran or the like. And still further, each said step, or a file or object or the like implementing each said step, may be executed by special purpose hardware or a circuit module designed for that purpose.

Accordingly, the scope of protection of this invention is limited only by the following claims and their equivalents.